DP Barcode: D351036 MRID No.: 474180-02

DATA EVALUATION RECORD
HONEY BEE - ACUTE CONTACT & ORAL LC_{50} TEST

i 141-1

1. CHEMICAL: Fosetyl-AL PC Code No.: 123301

2. TEST MATERIAL: EXP10369F Purity: 794 g/kg (79.4%)

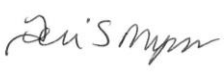
3. CITATION

Authors:	Schmitzer, S.
Title:	Laboratory Testing for Toxicity (Acute Contact and Oral LD_{50}) of EXP10369F on Honey Bees (*Apis mellifera* L.) (Hymenoptera, Apidae)
Study Completion Date:	November 8, 1999
Laboratory:	Institut für Biologische Analytik und Consulting IBACON GmbH, Rossdorf, Germany
Sponsor:	Rhône-Poulenc Agro, Ecotoxicology Department, Sophia Antipolis, France
Laboratory Report ID:	5961036
MRID No.:	474180-02
DP Barcode:	D351036

4. REVIEWED BY: John Marton, Staff Scientist, Cambridge Environmental, Inc.

Signature:  **Date:** 06/04/08

APPROVED BY: Teri S. Myers, Senior Scientist, Cambridge Environmental, Inc.

Signature:  **Date:** 06/16/08

5. APPROVED BY: Ron Dean, {Specialty}, OPP/EFED/ERB-{Section}

Signature: **Date:**

6. DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to honey bees via oral and contact exposure routes. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient

information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

7. STUDY PARAMETERS:

Scientific Name of Test Organism:	*Apis mellifera* L.
Age of Test Organism at Test Initiation:	4-6 week old females
Type of Concentrations:	Nominal (Contact) and Actual Uptake (Oral)
Definitive Test Duration:	48 hours for both tests

8. CONCLUSIONS:

The honey bee, *Apis mellifera*, was exposed to EXP10369F (Fosetyl-AL) for 48 hours in the oral and the contact test. The contact and oral nominal concentrations were 0 (untreated and solvent controls), 102, 142, 199, 278 and 390 µg ai/bee. The actual intake concentrations of EXP10369F (Fosetyl-AL) in the oral toxicity test were 122, 164, 246, 333 and 440 µg ai/bee. By 48 hours in the oral test, mortality was 3.3% in the 164 µg ai/bee treatment group, 6.7% in the 440 µg ai/bee treatment group, and 0% in the remaining treatment groups and control. No abnormal behaviors were noted. By 48 hours in the contact test, mortality was 3.3% in the untreated control and 142 µg ai/bee treatment group, and 0% in the remaining treatment groups. No abnormal behaviors were noted. **The LC_{50} value for the oral test was >440 µg ai/bee. The LD_{50} value for the contact test was >390 µg ai/bee. As a result, EXP10369F (Fosetyl-AL) is categorized as practically non toxic to honey bees *on an acute contact basis*.** The NOAELs for the oral and contact tests were 440 and 390 µg ai/bee, respectively.

This study is scientifically *sound/unsound* and *satisfies/does not satisfy* the EFED concerning the guideline requirements for a contact toxicity test with honey bees

(Subdivision L, ï 141-1 or 850.3020). **This study is classified as *ACCEPTABLE/SUPPLEMENTAL/INVALID*.**

Reported Statistical Results - Oral Test:

LC_{50}: >440 µg ai/bee
NOAEL: 440µg ai/bee
LOAEL: >440 µg ai/bee
95% C.I.: N/A
Probit Slope: N/A

Reported Statistical Results - Contact Test:

LD_{50}: >390 µg ai/bee 95% C.I.: N/A
NOAEL: 390 µg ai/bee Probit Slope: N/A
LOAEL: >390 µg ai/bee

9. ADEQUACY OF THE STUDY:

A. Classification: Acceptable/Supplemental/Invalid

B. Rationale:

C. Repairability:

10. GUIDELINE DEVIATIONS: This study was conducted following guidelines outlined in EPPO 1992, Guideline on test methods for evaluating the side-effects of plant protection products on honey bees, Bulletin OEPP/EPPO Bulletin 22, 203-215 1992, No 170. There are no OPPTS guidelines for honey bee acute oral toxicity testing, but the following deviation is noted with respect to OPPTS 850.3020, Honey Bee, Acute Contact Toxicity Test:

OPPTS guidance recommends that the relative humidity be maintained between 50 and 80%; however, humidity ranged from 45 to 65% during the study. The study author reported that the broader humidity range was easier to manage and it did not influence the outcome of the study.

This deviation does/does not impact the acceptability of the study.

11. SUBMISSION PURPOSE: This study was submitted to provide the acute effects on Honey Bees (*Apis mellifera*) following oral and contact exposure to EXP10369F (Fosetyl-AL).

12. MATERIALS AND METHODS:

A. Test Organisms

Guideline Criteria	Reported Information
Species: Species of concern (*Apis mellifera, Megachile rotundata*, or *Nomia melanderi*)	*Apis mellifera*
Age at beginning of test:	4-6 week old females
Supplier:	On-site honey bee colonies

Guideline Criteria	Reported Information
All bees from the same source?	Yes

B. Test System

Guideline Criteria	Reported Information
Cage size adequate?	Test chambers were stainless steel cages measuring 10 x 8.5 x 5.5 cm. The front of the cage was a removable glass sheet, the bottom was perforated with 98 ventilation holes (ø 1 mm), and the inner walls were lined with filter paper.
Lighting:	Constant darkness except during observations.
Temperature:	27-28°C
Relative humidity:	45-65%

C. Test Design

Guideline Criteria	Reported Information
Range finding test?	No range-finding data were provided.
Reference toxicant test?	Perfekthion EC (Dimethoate; 395.7 g/L). Honey bees in the toxic standard control group were treated with 0.2 µg ai/bee for both tests.
Method of administration:	Oral test: 22-25 mg of EXP10369F contaminated honey were offered in syringes; duration of uptake did not exceed 3 hours Contact test: a single 5 µL drop of EXP10369F in solvent was planted on the ventral thorax of each bee using a Burkard-Applicator
Nominal doses:	Oral test: 102, 142, 199, 278 and 390 µg ai/bee Contact test: 102, 142, 199, 278 and 390 µg ai/bee
Controls: Negative control and/or diluent/solvent control	Oral test: Pure honey Contact test: Negative (untreated) and Solvent (Adhäsit)
Number of colonies per group:	Oral test: 3 reps per treatment group, with 10 bees per rep Contact test: 3 reps per treatment group, with 10 bees per rep
Solvent: The following solvents: acetone, dimethylformamide, triethylene glycol, methanol, ethanol.	Oral test: N/A- no solvent was used Contact test: Adhäsit. The solvent was used to improve the adhesion of the droplet on the bee body. The solvent is non-toxic to honey bees.

Guideline Criteria	Reported Information
Feeding:	Oral and Contact Tests: Commercial ready-to-use syrup (Apiinvert; 30% Saccharose, 31% Glucose, 39% Fructose) *ad libitum*; was given directly after treatments in syringes. No replacements of the syringes were necessary during the 48-hour exposure period.
Observations period:	Oral test: 1, 2, 4, 24 and 48 hours Contact test: 1, 2, 4, 24 and 48 hours

13. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes. Signed and dated No Data Confidentiality, GLP and Quality Assurance statements were provided. This study was conducted in compliance with the OECD Principles of Good Laboratory Practice (as revised in 1997) ENV/MC/CHEM (98) 17; and Chemikaliengesetz (Chemicals Act) der Bundesrepublik Deutschland (ChemG), Anhang 1 (Annex 1), 2002.
Control performance:	Oral test: 0% in the negative control and 73.3% in the toxic standard group Contact test: 3.3% in the negative control, 0% in the solvent control and 100% in the toxic standard group
Raw data included:	Yes
Signs of toxicity (if any) were described?	Yes

Mortality - Oral Test

Dosage µg ai/bee (actual intake)	**No. of bees**	**Percent Mortality (%)**	
		Hour of Study	
		24	**48**
Test Substance			
Negative Control	30	0	0
122	30	0	0
164	30	0	3.3
246	30	0	0
333	30	0	0
440	30	3.3	6.7
Toxic Standard			
0.2 µg ai/bee	30	70.0	73.3

Observations:

By 48 hours in the oral test, mortality was 3.3% in the 164 µg ai/bee treatment group, 6.7% in the 440 µg ai/bee treatment group, and 0% in the remaining treatment groups and control. No abnormal behaviors were noted. The resulting LD_{50} value was >440 µg ai/bee.

By test termination, mortality was 73.3% in the toxic standard group.

Mortality - Contact Test

Dosage µg ai/bee	No. of bees	Percent Mortality (%)	
		Hour of Study	
		24	48
Test Substance			
Untreated Control	30	3.3	3.3
Solvent Control	30	0	0
102	30	0	0
142	30	3.3	3.3
199	30	0	0
278	30	0	0
390	30	0	0
Toxic Standard			
0.2 µg ai/bee	30	100	100

Observations:
By 48 hours in the contact test, mortality was 3.3% in the untreated control and 142 µg ai/bee treatment group, and 0% in the remaining treatment groups. No abnormal behaviors were noted. The resulting LD_{50} value was >390 µg ai/bee.

By test termination, mortality was 100% in the toxic standard group.

Statistical method: No analyses were conducted.

Reported Statistical Results - Oral Test:

LC_{50}: >440 µg ai/bee 95% C.I.: N/A
NOAEL: 440µg ai/bee Probit Slope: N/A
LOAEL: >440 µg ai/bee

Reported Statistical Results - Contact Test:

LD_{50}: >390 µg ai/bee 95% C.I.: N/A
NOAEL: 390 µg ai/bee Probit Slope: N/A
LOAEL: >390 µg ai/bee

14. VERIFICATION OF STATISTICAL RESULTS:

Statistical method: Mortality did not exceed 6.7% in the oral test or 3.3% in the contact test. Because the mortality was within the maximum allowable control mortality per OPPTS Guidance (≤10%), the reviewer visually determined the toxicity values. The results for the oral test were based on actual uptake concentrations and the results for the contact test were based on the nominal concentrations.

Results - Oral Test:

LC_{50}: >440 µg ai/bee 95% C.I.: N/A
NOAEL: 440µg ai/bee Probit Slope: N/A
LOAEL: >440 µg ai/bee

Results - Contact Test:

LD_{50}: >390 µg ai/bee 95% C.I.: N/A
NOAEL: 390 µg ai/bee Probit Slope: N/A
LOAEL: >390 µg ai/bee

15. REVIEWER↘S COMMENTS:

The reviewer's results were identical to those of the study authors.

The in-life portion of the definitive oral and contact tests was conducted between August 24 and 27, 1999.

16. REFERENCES:

Barrett, K.L., Grandy, N., Harrison, E.G., Hassan, S.A. and Oomen, P. 1994: SETAC- Guidance document on regulatory testing procedures for pesticides with non-target arthropods. 28-30 March 1994, IAC Wageningen, The Netherlands.

Chemikaliengesetz der Bundesrepublik Deutschland (ChemG), Anhang 1 in der Fassung der

Bekanntmachung vom 25. Juli 1994 (BGBI. I S. 1703) mit Anderungen vom 27. September 1994 (BGBI I S. 2705) und 14 Mali 1997 (BGBI I S. 1060).

EC Agrochemical Registration Directive (DS65) (Directive 91/414/EEC). ANNEX II. Requirements for the dossier to be submitted for the authorization of a plant protection product.

EPPO 1992: Guideline on test methods for evaluating the side-effects of plant protection products on honey bees, Bulletin OEPP/EPPO Bulletin 22, 203-215 1992, No. 170.

OECD Principles of Good Laboratory Practice, adopted by Council on 26th November 1997 [C(97)186/Final], Environment Directorate, Organization for Economic Cooperation and Development, Paris 1998.